



# **Pre-Application Workshop**

**Electric Program Investment Charge (EPIC)  
Applied Research and Development  
Grant Solicitation**

**Advance Development of Breakthrough and  
Piezoelectric-Based Systems**

**GFO-16-302**

**Prab Sethi**

**Energy Generation Research Office  
Energy Research and Development Division  
California Energy Commission  
Rosenfeld Hearing Room, Sacramento  
August 4, 2016**



# Agenda

7/20	Topic
10:00 am	Welcome and Introductions <ul style="list-style-type: none"><li>• Housekeeping</li><li>• Commitment to Diversity</li><li>• Background</li><li>• Solicitation Purpose, Goals, Funding</li><li>• Eligible Applicants</li><li>• Key Dates</li></ul>
10:30 am	<ul style="list-style-type: none"><li>• Application requirements</li><li>• Attachment Overview</li><li>• Match Funding</li><li>• Proposal Approval Process</li></ul>
11:0 am	Questions and Answers on EPIC Bioenergy Solicitation
11:30 am	Adjourn & Networking



# Housekeeping

- In case of emergency
- Facilities
- Sign-in sheet
- Diversity Survey
  - Online Participant Link:
- <https://www.surveymonkey.com/r/CEC-08-04-2016>
- Updates on solicitation documents and today's presentation will be posted at:  
Advance Development of Breakthrough and Piezoelectric-Based Systems  
<http://www.energy.ca.gov/contracts/epic.html#GFO-16-302>



# Commitment to Diversity

The Energy Commission adopted a resolution strengthening its commitment to diversity in our funding programs. We continue to encourage disadvantaged and underrepresented businesses and communities to engage in and benefit from our many programs.

To meet this commitment, Energy Commission staff conducts outreach efforts and activities to:

- Engage with disadvantaged and underrepresented groups throughout the state.
- Notify potential new applicants about the Energy Commission's funding opportunities.
- Assist applicants in understanding how to apply for funding from the Energy Commission's programs.
- Survey participants to chart progress in diversity outreach efforts.



## Connect with the Energy Commission!



<https://www.facebook.com/CAEnergy/>



<http://bit.ly/CalEnergyNetwork>



<https://twitter.com/CalEnergy>

...and the Energy  
Commission's listserves  
[www.energy.ca.gov/listservers](http://www.energy.ca.gov/listservers)

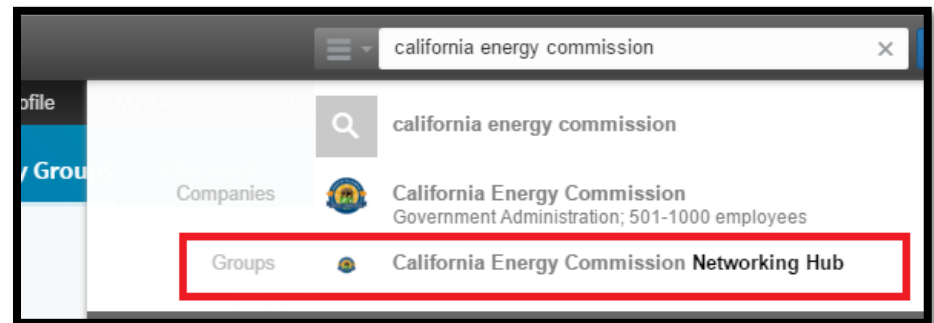


## Find Partners via LinkedIn

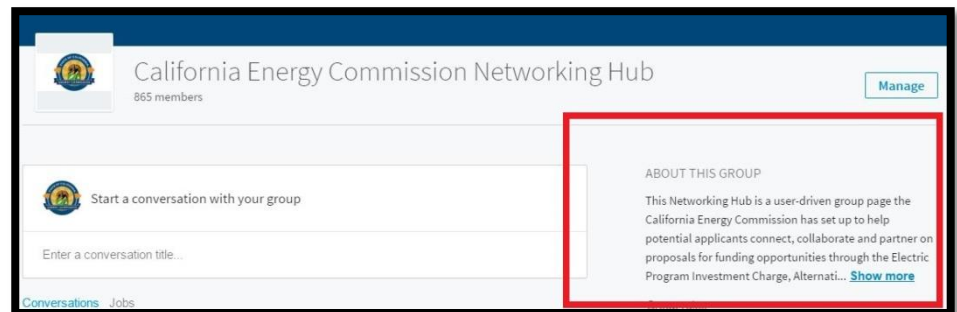
The Energy Commission created a user-driven LinkedIn group page to help potential applicants **connect**, **collaborate** and **partner** on proposals for funding opportunities.

Join the “California Energy Commission Networking Hub” using:

- The LinkedIn Search Box
- URL: [bit.ly/CalEnergyNetwork](https://bit.ly/CalEnergyNetwork)



Then, use the ‘About this Group’ section on the LinkedIn group page to find funding opportunity specific subgroups.



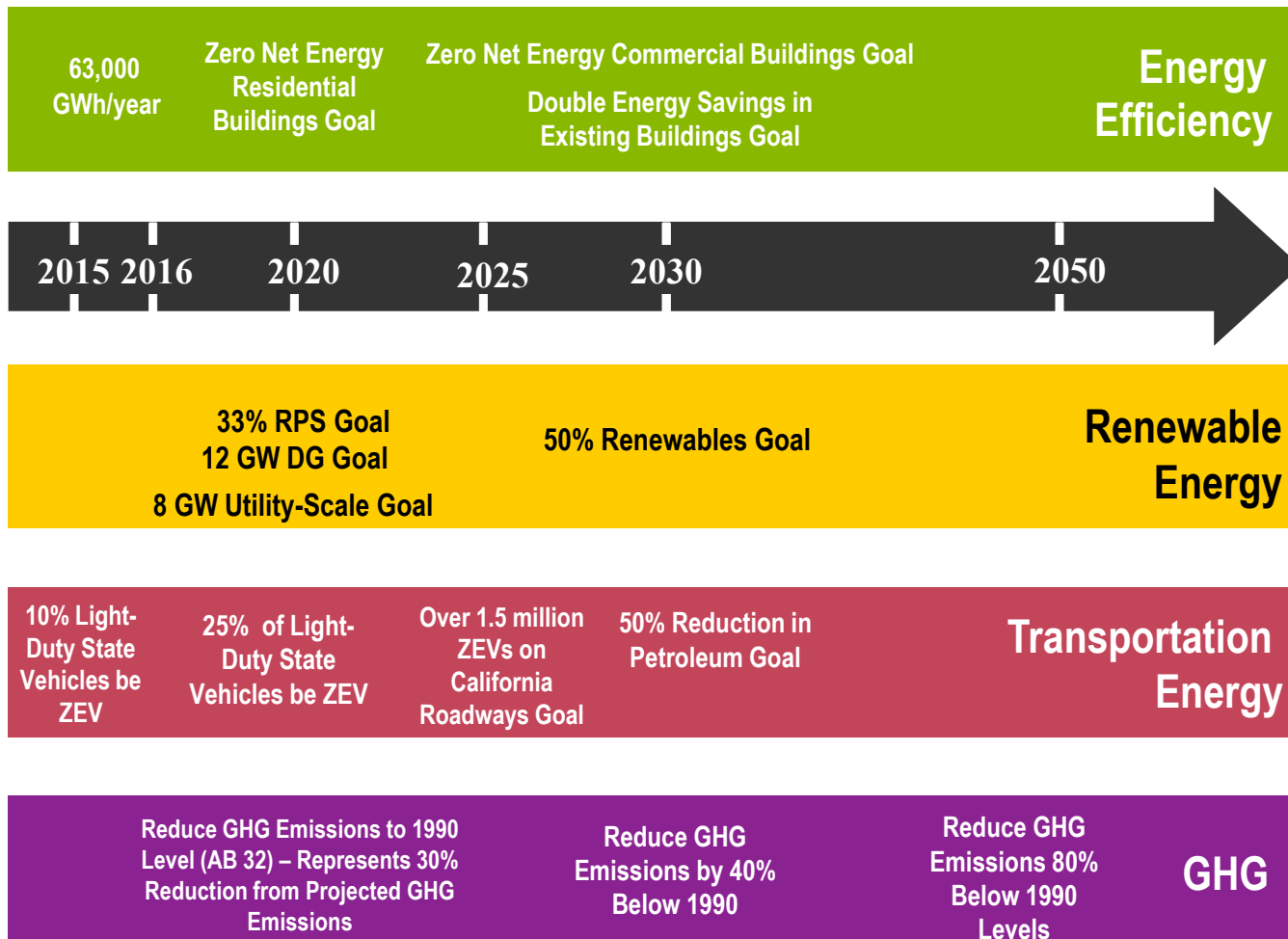


# Background

- The Electric Program Investment Charge (EPIC) is funded by an electricity ratepayer surcharge established by the California Public Utilities Commission (CPUC) in 2011.
  - Annual program funds total \$162 million with 80 percent administered by the California Energy Commission.
- The purpose of EPIC is to:
  - Benefit the ratepayers of the three electric investor-owned utilities, Pacific Gas and Electric Co., San Diego Gas and Electric Co., and Southern California Edison
  - Fund clean energy technology projects that promote greater electricity reliability, lower costs, and increased safety.
  - Encourage technological advancement and breakthroughs to achieve state's statutory energy goals.



# State Energy Policy Drives Energy RD&D Investments







# Key Drivers

## **Laws and Regulations:**

- The Global Warming Solutions Act of 2006 (AB 32, Pavley & Nunez, 2006)
- Clean Energy and Pollution Reduction Act of 2015 (SB 350, De Leon, 2015)
- Renewables Portfolio Standard (SB X1-2, Smitian, 2011) and others
- Senate Bill 96

## **Policies/Plans**

- Governor Brown's Clean Energy Jobs Plan (2011)
- Bioenergy Action Plan (2012)
- Integrated Energy Policy Report (Biennial)
- Governor Brown's:
  - Executive Order B-30-15 to establish GHG reduction target of 40% below 1990 levels by 2020



# Electric Program Investment Charge (EPIC)





# Solicitation Background

## **EPIC Triennial Investment Plan:**

- **Program Area:** Applied Research and Development (AR&D)
- **Strategic Objective S3:** Develop Innovative Solutions to increase the Market Penetration of Distributed Renewable and Advanced Generation
  - **Funding Initiative S3.4** - Advance Breakthroughs in Renewable Energy Technologies to Dramatically Increase Efficiencies, Reduce Costs, and Enable Additional Renewable Resources, and **(Group 1)**
  - **Funding Initiative S3.5** - Develop Piezoelectric-Based Systems for Harvesting Energy to Maximize Efficient Use of Emerging Energy Sources in California **(Group 2)**



## Solicitation Purpose

- Fund applied research and development activities to advance breakthroughs in renewable energy technologies to dramatically increase efficiencies, reduce costs, and enable additional renewable resources.
- Fund development of piezoelectric-based systems for harvesting energy to maximize efficient use of emerging energy sources in California.
- Awards will support development, lab-scale, and pilot-scale demonstrations of pre-commercial technologies and strategies that are designed to solve specific problems in the electric generation sector.



## Group 1: Advance Breakthroughs in Distributed Renewable Energy Technologies

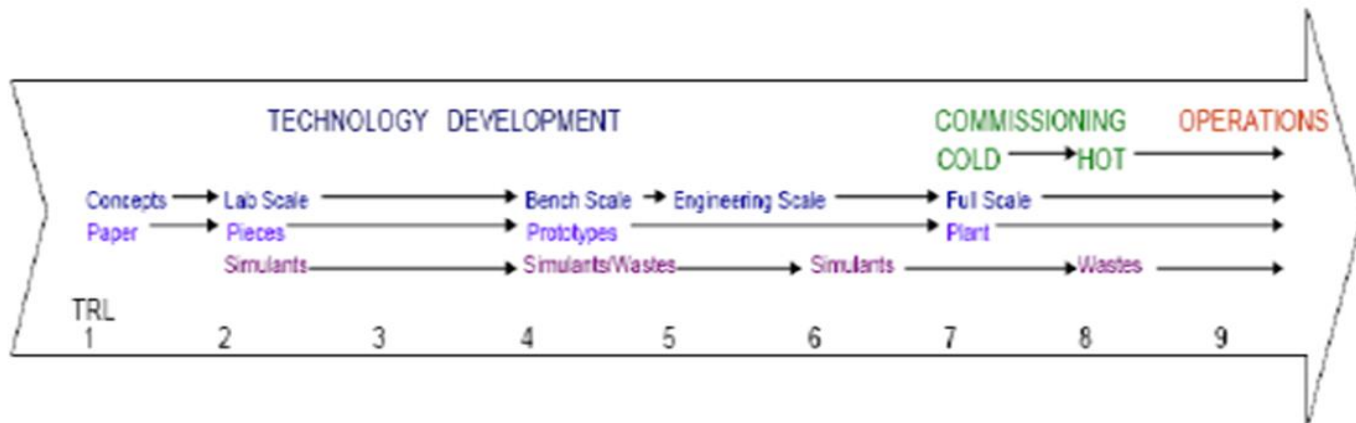
### Goals:

- Develop early-stage innovative electricity generation technologies and novel applications with breakthrough potential in the commercial market.
- Target technology advancements that will dramatically increase energy conversion efficiencies, reduce system costs, and expand the use of potential renewable resources that are not currently utilized for electricity generation.
- Develop novel systems and technologies to address issues on efficiency, affordability, reliability, and durability that will enable accelerated integration and deployment of renewable-based distributed generation technologies.



## Minimum Eligibility Criteria

- Proposed breakthrough technology or process must result in net generation of electricity.
- Technology readiness level from TRL2 to TRL5<sup>1</sup> for breakthroughs (laboratory to < pilot scale demonstration)



- <sup>1</sup>Technology Readiness Level, Department of Energy  
<http://www2.lbl.gov/dir/assets/docs/TRL%20guide.pdf>

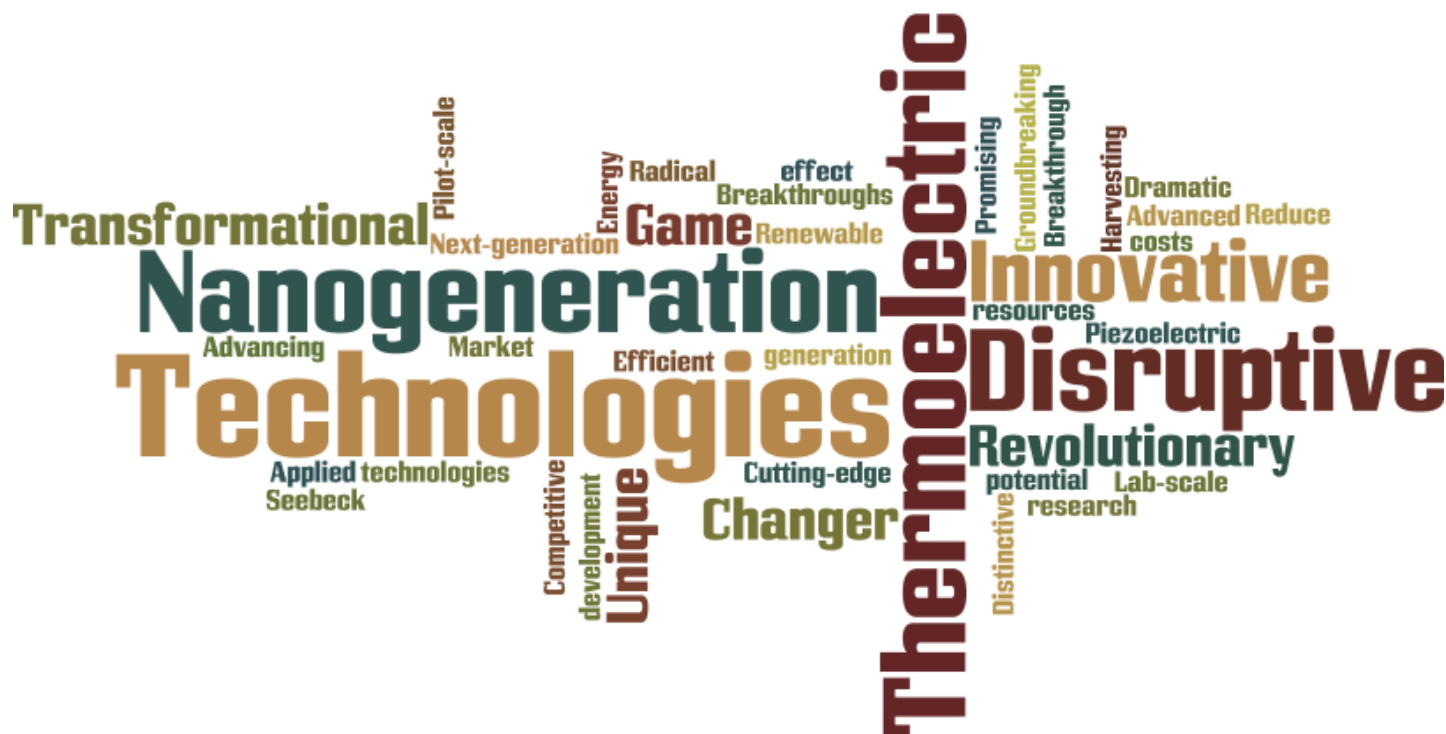


## Minimum Eligibility Criteria (Cont.)

- Proposed breakthrough technology or process - net generation of electricity
- Market potential – equal or greater than 100 times the initial investment.
- Must meet or exceed the latest California Air Resource Board and local air district emissions standards.
- A credible purpose and a projected competitive advantage over existing commercial technology



# Breakthrough Technologies



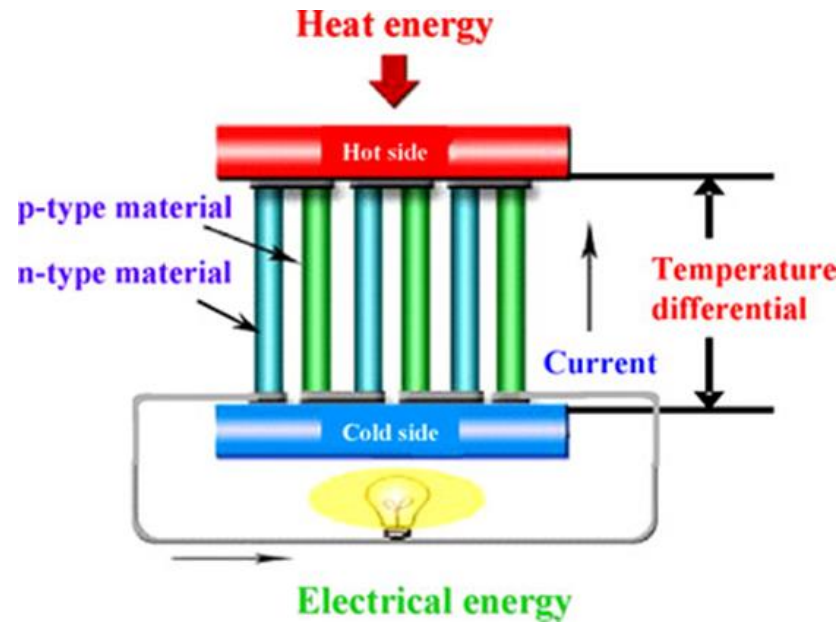




# Possible Breakthrough Technologies



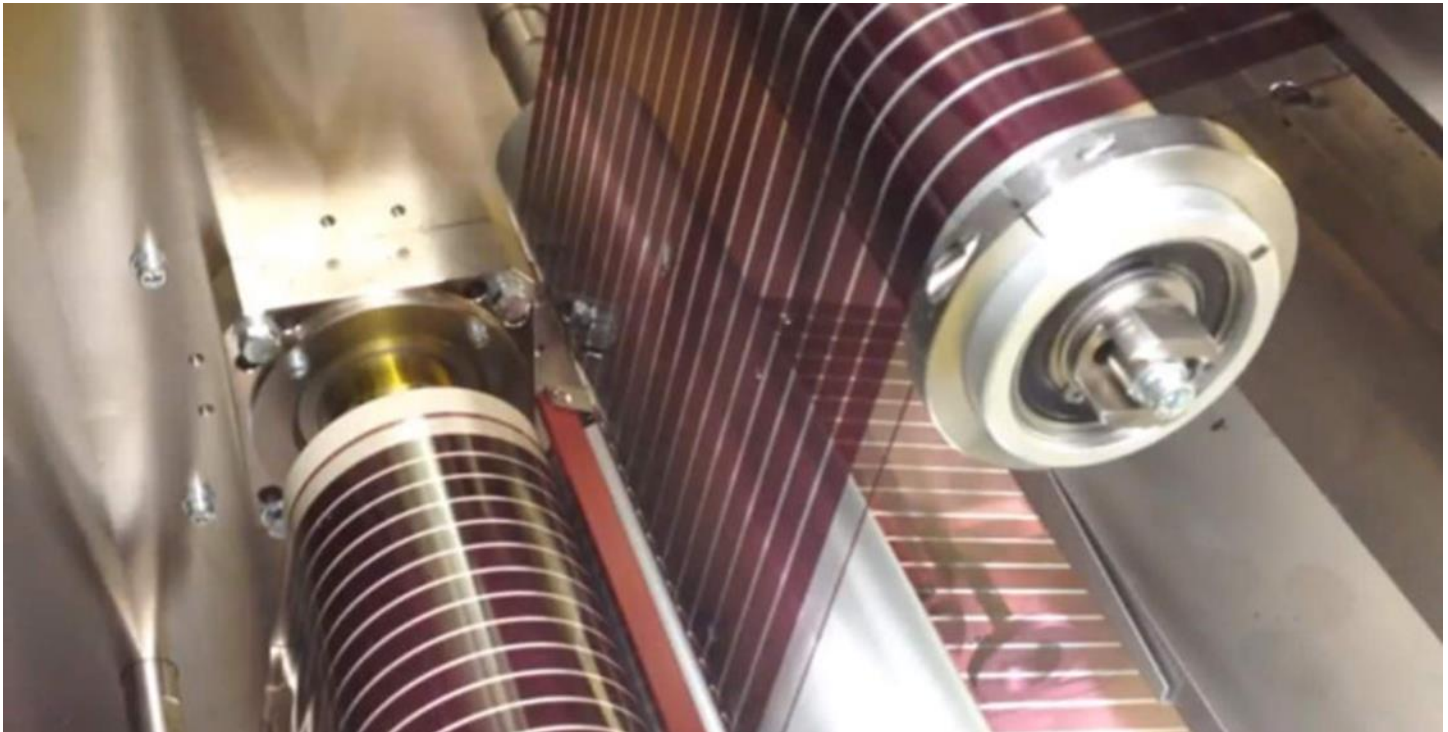
# Thermoelectric Power Generation from Waste Heat



By using the Seebeck effect, enough electricity can be produced to charge a cell phone and other USB devices



# Advanced Solar Cells Printing



Needs to be part of an applied research and development system



# Nanogeneration Technologies

- Nanogeneration energy-harvesting technologies to enable devices to power themselves based on ambient electromagnetic, thermal, or mechanical energy.
- Must have competitive advantages over existing commercial technology.



## Target Specifications

- 15 percent increase in technical performance and/or energy conversion efficiency;
- 20 percent reduction in unit cost of renewable energy generation;
- Increased reliability and durability resulting in lifetime greater than or equal to 10 years; and
- Competitive advantage over existing commercial technology or applications.

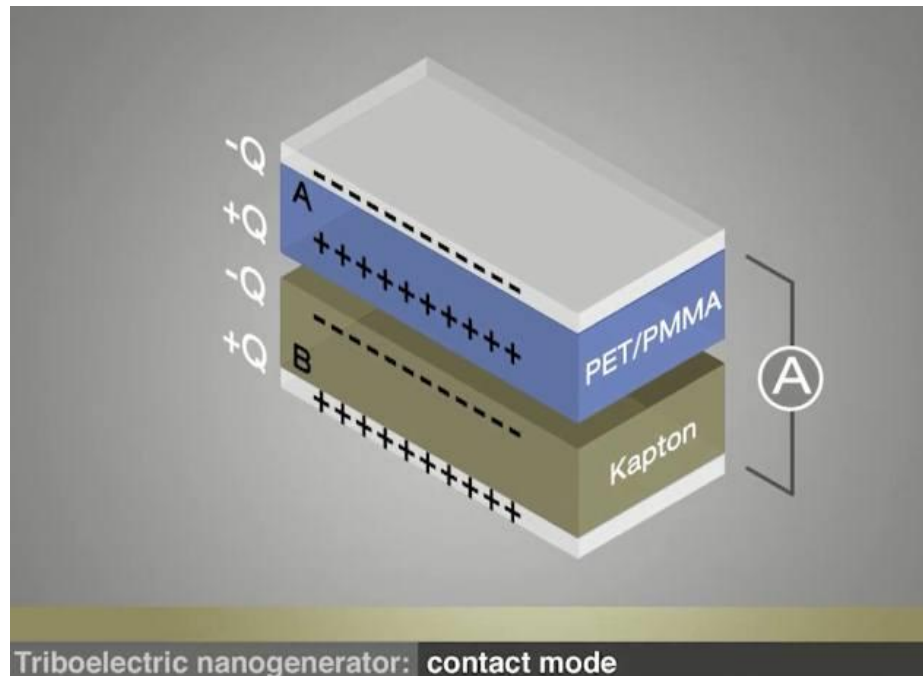


## Ineligible Technologies

- Concentrating PV or hybrid PV/thermal technologies
- Biomass conversion and biogas generation technologies
- Ocean energy and tidal power technologies
- Biofuel production technologies

## Group 2: Piezoelectric-based Systems for Energy Harvesting

### Piezoelectric Effect



Miniature Generator based on piezoelectric effect,  
which is electricity resulting from pressure.



## Group 2 – Development of Piezoelectric-Based Systems

### Goals:

- Advance electricity generation technologies by application of piezoelectric materials and utilizing wasted mechanical energy
- Assessment of piezoelectric system applications to determine technical and economic feasibilities, projected power output, costs, and marketing potentials
- Evaluate technology to quantify performance, durability, lifetime, and integration of energy storage to address expected intermittency during power generation.
- Pilot scale projects to harvest power from existing roadway surfaces, train tracks, or sidewalk applications to cost-effectively increase renewable energy capacity





## Target Specifications

- LCOE less than or equal to \$0.10/kWh;
- Capital cost less than \$10,000/kW;
- Power density greater than or equal to 300 W/sq ft;
- Lifetime greater than or equal to 15 years;



## Project Groups

- Each group will be evaluated and scored separately
- Each Application must address only one project group
- Applicants may submit more than one Application as long as each application is for a distinct scope of work, with no duplication



## Available Funding

Up to **\$7 million** available for this solicitation.

Project Group	Available Funding	Min Award	Max Award	Min Match Funding	Estimated No. of Awards
<b>Group 1:</b> Breakthrough Technologies	<b>\$5,000,000</b>	<b>\$350,000</b>	<b>\$2,000,000</b>	<b>\$0</b>	3-6
<b>Group 2:</b> Piezoelectric-Based Systems	<b>\$2,000,000</b>	<b>\$700,000</b>	<b>\$2,000,000</b>	<b>\$0</b>	1-3



## Eligible Bidders

- This is an open solicitation for public and private entities, except for publicly owned utilities.
- Applicants must accept the EPIC terms and conditions.
  - Standard T&Cs: <http://www.energy.ca.gov/research/contractors.html>
- Applicants are required to register with the California Secretary of State and be in good standing to enter into an agreement with the Energy Commission. <http://www.sos.ca.gov>



# Key Dates

Activity	Action Date
✓ Solicitation Release	7/27/2016
Pre-Application Workshop Sacramento	8/4/2016 10:00 am
<b><u>DEADLINE FOR WRITTEN QUESTIONS</u></b>	<b><u>8/9/2016 5:00 pm</u></b>
Anticipated Distribution of Questions and Answers	Week of 8/29/2016
<b><u>DEADLINE TO SUBMIT ABSTRACTS (Phase 1)</u></b>	<b><u>9/9/2016 3:00 pm</u></b>
Anticipated Posting of Phase 1 Results	Week of 10/17/ 2016
<b><u>DEADLINE TO SUBMIT APPLICATIONS (Phase 2)</u></b>	<b><u>11/18/2016 3:00 pm</u></b>
Anticipated Notice of Proposed Award Posting Date	1/13/2017
Anticipated Energy Commission Business Meeting Date	5/5/2017
Anticipated Agreement Start Date	6/16/2017
Agreement Termination Date	3/31/2021



# GFO Application Requirements (for *Electronic Submission*)

- Preferred method of Delivery is the Energy Commission Grant Solicitation System, available at: <https://gss.energy.ca.gov/>.
  - Electronic files must be in Microsoft (.doc or .docx format) and Excel Office Suite formats, unless originally provided in solicitation in another format.
- Attachments requiring signatures may be scanned and submitted in PDF format.
- Completed Budget Forms (Attachment 7) must be in Excel format.
- First-time users must register as a new user to access system.
- The system will not allow applications to be submitted after the due date and time
  - (Phase 1 - 8/29/16 at 3:00 p.m. PDT; Phase 2 – 11/18/16 at 3:00 p.m.).



# Live Demo Tutorial *(for Electronic Submission)*



GSS How to Apply Video.mp4



# GFO Application Requirements

## *(for Hard Copy Submittal)*

- Submit Applications with all attachments in the order specified by the due date and time listed in Section III of the manual.
- Application documents should meet formatting requirements, page limits, and number of copies specified on pages 22 (Phase 1) and page 23 (Phase 2) .
- Electronic Method for Delivery:  
Phase 1 and Phase 2
- Hard Copy Delivery:
  - **Phase 1 - One** hard copy (signed) and **one** electronic\* copy
  - **Phase 2 - One** hard copy (signed) and **one** electronic\* copy

\* on a CD-ROM or USB memory stick





# Application Requirements

**Each Applicant must complete and include the following:**

1. Application Form (Phases 1 & 2)	7. Budget (Phase 2 ONLY)
2. Project/Executive Summary (Phase 1 and 2)	8. CEQA Compliance Form (Phase 2)
3. Fact Sheet (Phase 2 ONLY)	9. References and Work Product (Phase 2 ONLY)
4. Project Narrative (Phases 2)	10. Contact List (Phase 2 ONLY)
5. Project Team (Phase 2 ONLY)	11. Intent Letters (Phase 1 ONLY, as applicable) Commitment and Support Letters (Phase 2 ONLY)
6. Scope of Work (Phase 2 ONLY)	12. Cost Benefit Calculations (Phase 2 ONLY)

**Be consistent in your application!**



## Project Abstract (Phase 1)

- Explain how it meets the solicitation requirements and why it is worth funding.
- Include detailed description of the proposed project according to the Application and Technical Abstract Screening Criteria Section IV, part E (pages 34-35)
- Abstract should include: **(limit 8 pages)**
  - Why your project is important?
  - What is the development stage, project focus, and group specific qualifications?
  - How will the project advance the generation of renewable electricity?
  - How will IOU ratepayers benefit?
  - Other criteria described in the Technical Abstract Screening Criteria

**Provide enough detail so that reviewers will be able to evaluate the proposal against each of the scoring criteria**



## Project Narrative (Phase 2)

- Explain how it meets the solicitation requirements and why it is worth funding.
- Include detailed description of the proposed project according to the Application Scoring Criteria – Section IV, part G (Pages 38-43)
- The narrative should explain things such as: (limit 20 pages)
  - Why your project is important?
  - How will it advance, supplement, and/or replace current technology and/or scientific knowledge?
  - Why is EPIC funding justified – why is the work not adequately funded by competitive or regulated markets?
  - How will IOU ratepayers benefit?
  - What it is going to cost ratepayers, and why is it worth it?
  - Other aspects described in the Scoring Criteria

**Provide enough detail so that reviewers will be able to evaluate the proposal against each of the scoring criteria**



## Scope of Work

- Tell us exactly what you are proposing to do in your project.
- Identify what you will deliver to the Energy Commission.
- Be sure to include in the tasks:
  - An annual report
- Be sure to include Project Schedule (**Attachment 6a**)



## Budget (Attachment 7)

Identify how you will be spending EPIC funding and match funds to complete this project.

- Each Applicant and major subcontractor must complete all of the the budget forms.
- This must be submitted in the same format as it is provided.
- Do not delete sheets or rows, use the hide/expand functions.
  - Shaded cells are automatically filled or calculated.



# Intent, Commitment and Support Letter Form (Attachment 11)

## Phase 1:

- Intent Letter - documents intent to secure site control in case of pilot demonstration projects.

## Phase 2 AR&D Pilot

- Commitment Letter - commits an entity or individual to providing match funding and/or deployment site for the proposed activities.
- Any project partners that will make contributions to the project must submit a Commitment Letter.

## Phase 2 All Applicants

- Support Letter - **at least one** support letter from a project stakeholder. Support letter details an entity's or individual's support for the project.



# Match Funding

- **Groups 1 and 2** may receive bonus points for match funding.
- During Phase 2, Applicants may receive up to 10 additional points based on the criteria below:
  - Up to 5 points will be awarded based on the percentage of match funding compared to the requested EPIC funds.
  - Remaining 5 points will be based on quality of match funding

**Phase 2** - Match funding contributors must submit match funding commitment letters that meets the requirements of Attachment 11. Failure to do so will disqualify the match funding commitment from consideration.



# How will my Application be Evaluated?

## → Phase 1 Application Screening (Administrative)

### Application Admin Screening Process

1. Energy Commission staff screens applications per criteria in the solicitation (page 34-35).
2. Criteria is evaluated on a pass/fail basis.
  - ✓ Applicants must pass all screening criteria or the application will be disqualified.

### Some Reasons for Disqualification

- ✓ Application not submitted by the specified due date and time.
- ✓ Applicant did not belong to one of the eligible project groups.
- ✓ Requested funding is outside of the specified minimum/maximum range.
- ✓ Project completion date beyond the specified agreement end date.
- ✓ Application does not include one or more support letters.
- ✓ Application contains confidential material.





# How will my Application be Evaluated?

## → Phase 2 Administrative Screening

### Application Admin Screening Process

1. Energy Commission staff screens applications per criteria in the solicitation page 36.
2. Criteria is evaluated on a pass/fail basis.
  - ✓ Applicants must pass all screening criteria or the application will be disqualified.

### Some Reasons for Disqualification

- ✓ Application not submitted by the specified due date and time.
- ✓ Applicant did not belong to one of the eligible project groups.
- ✓ Requested funding is outside of the specified minimum/maximum range.
- ✓ Project completion date beyond the specified agreement end date.
- ✓ Application does not include one or more support letters.
- ✓ Application contains confidential material.



## How will my Application be Evaluated?

- **Evaluation Committee applies the scoring scale to the scoring criteria.**
- **Applications must obtain a minimum passing score of 70% for criteria 1-4 (or 49 points) in order to continue evaluation, and must also obtain a minimum passing score of 70% overall for criteria 1-7 (or 70 points), in order for an Application to be considered for funding. Passing applications will be considered for match funding preference points.**
- **Each Applicant must review the Evaluation and Award Process section of the solicitation and ensure that the application provides a clear and complete response to each scoring criteria in the project narrative.**

Scoring Criteria (pages 28-32)	Maximum Points
Technical Merit and Need	20
Technical Approach	20
Impacts and Benefits for CA IOU Ratepayers	20
Team Qualifications, Capabilities and Resources	10
Budget Cost-Effectiveness	10
EPIC Funds Spent in CA	15
Ratio of Direct Labor and Fringe Benefit Rates to Loaded Labor Rates	5
Total	100
<b>Minimum points to pass</b>	<b>70</b>



## How can I receive optional bonus points?

- **Match**
  - **Group 1**
  - **Groups 2**
  
- **Disadvantaged Communities**
  - **Group 1**
  - **Groups 2**

Scoring Criteria (pages 51-56)	Maximum Points
8. Match Funding	10
9. Disadvantaged Communities	5
<u>Possible Bonus Points</u>	
Group 1 - Criteria 8 and 9	15
Group 2 - Criteria 8 & 9	15



## What is the Technical Scoring Scale?

% of Possible Points	Interpretation	Explanation for Percentage Points
0%	Not Responsive	Response does not include or fails to address the requirements being scored. The omission(s), flaw(s), or defect(s) are significant and unacceptable.
10-30%	Minimally Responsive	Response minimally addresses the requirements being scored. The omission(s), flaw(s), or defect(s) are significant and unacceptable.
40-60%	Inadequate	Response addresses the requirements being scored, but there are one or more omissions, flaws, or defects or the requirements are addressed in such a limited way that it results in a low degree of confidence in the proposed solution.
70%	Adequate	Response adequately addresses the requirements being scored. Any omission(s), flaw(s), or defect(s) are inconsequential and acceptable.
80%	Good	Response fully addresses the requirements being scored with a good degree of confidence in the Applicant's response or proposed solution. No identified omission(s), flaw(s), or defect(s). Any identified weaknesses are minimal, inconsequential, and acceptable.
90%	Excellent	Response fully addresses the requirements being scored with a high degree of confidence in the Applicant's response or proposed solution. Applicant offers one or more enhancing features, methods or approaches exceeding basic expectations.
100%	Exceptional	All requirements are addressed with the highest degree of confidence in the Applicant's response or proposed solution. The response exceeds the requirements in providing multiple enhancing features, a creative approach, or an exceptional solution.



## What is Important?

Scoring Criteria	The Question to Answer
Technical Merit and Need	Why should your project be funded?
Technical Approach	How you're going to do what you're going to do?
Impacts and Benefits for CA IOU Ratepayers	How will your project benefit ratepayers?
Team Qualifications, Capabilities and Resources	Who is going to make this project happen, and what resources are available to make it happen?
Budget Cost-Effectiveness	Are you spending money wisely?
EPIC Funds Spent in CA	This is a direct calculation based on budget forms.
Ratio of Direct Labor and Fringe Benefit Rates to Loaded Labor Rates	This is a direct calculation based on budget forms.



# Questions and Answers

Please send all questions related to GFO-16-302 to:

**Diana Parmley**

Commission Agreement Officer

1516 Ninth Street, MS-18

Sacramento, CA 95814

(916) 651-9409

[Diana.Parmley@energy.ca.gov](mailto:Diana.Parmley@energy.ca.gov)

Please use e-mail Subject Heading:  
“Question GFO-16-302”

**Deadline to submit questions:**

**Tuesday, August 9, 2016 5:00 PM Pacific Time**



**Thank you!**